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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,290	07/25/2003	Kutay F. Ustuner	2003P05316US	4272

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Siemens Corporation
Intellectual Property Department
170 Wood Avenue South
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EXAMINER

JAWORSKI, FRANCIS J

ART UNIT	PAPER NUMBER
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3737

DATE MAILED: 03/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/627,290

Applicant(s)

USTUNER ET AL.

Examiner

Jaworski Francis J.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 30 is/are pending in the application.
- 4a) Of the above claim(s) 14-19,23,26 and 28-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13,20-22,24,25 and 27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07252002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 09102003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Applicants' traverse of the election requirement has been considered but found unpersuasive because for example correlation and other object field statistical comparisons require a separate search for example in class 382 image processing.

A claim 8 is absent from the claims originally presented and therefore claims 9 – 31 have been renumbered as claims 8 – 30 under Rule 126 governing consecutive numbering, and dependencies have been altered accordingly.

Therefore claims 1 – 13, 20-22, 24-25 and 27 are present for examination; claims 14 – 19, 23, 26 and 28 – 30 stand withdrawn from consideration pursuant to the election with traverse in the response filed 12/14/04.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

[The terms 'grating lobe' and 'sidelobe' have distinctly different meanings in the art, see Hildebrand (US4179683 col. 1).]

Claims 1, 12, 20,22, 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Iseki et al (JP 02209135 A Abstract) which teaches a method and system for adaptive ultrasound grating lobe suppression including acquiring data from array 10,

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determining a grating lobe level by comparing the amplitudes and therefore energies of closely spaced elements and selecting the smaller level as output of the data for further processing. (Claims 1, 22, 25).

Since the process is shown depicted as data entering a digital scan converter which by definition organizes the scan image for monitor display the energy comparison is necessarily for data points of the spatial field of a scanned region within which a grating lobe is necessarily extent in two dimensions. (Claim 12).

The rejection or suppression of the grating effect occurs by identification of the lobe in relation to a nearby sampled location and in association with delay and focus control circuits which are equivalent terminology for beamformation components (Claim 20).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iseki et al as argued against claim 1, further in view of Yamaguchi et al (US4631710). The former being applied as above, although unstated literally therein it would necessarily follow that grating lobe suppression practiced by whatever technique including amplitude or energy-based is tantamount to reducing ghosting clutter in the ensuing image signals, see Yamaguchi et al col. 1 since this is how the unsuppressed grating effect expresses

Claims 1 -13,20-22, 25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi et al (US4631710), alone or further in view of Iseki et al.

The former teaches a method for azimuth adaptive ultrasound grating lobe suppression including initially acquiring ultrasound phased array data at differing scan angles and determining at least grating lobe presence at certain angles (Col. 1 lines 57-62), and providing angularly adapted filter processing in response to the grating lobe level for all locations in the image. Although it does not inherently follow that the determination is based upon a level (as opposed to say a qualitative visual observation as per subsequent col. 1-2 bridging portion), observation of a level would be an obvious way of observing a rise in artifact measurable in terms of its energy. In the alternative it would have been obvious to do so since Iseki et al uses an energy level threshold in a closely related grating lobe suppression technique for scan signal processing. Moreover the latter evidences that a fully automated signal processing

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scheme based upon received signal levels may be implemented. (Claims 1, 12-13, 21-22, 25).

The altered filter processing may be before or after beam mapping i.e. beamformation (col. 4 lines 21-26) and it would have been inherently obvious in assessing the efficacy of this design to compare ghosting level with or without this filter adaptation. (Claims 2-4).

Differences and ratios are obvious ways of expressing signal energy differences within beamed wave transmission systems since lobe energies are measured logarithmically in dB. (Claims 5 – 6).

For a given frequency the constant pass bandwidth narrowing imposition at a given extreme range of steering angle constitutes the implementation of a 0-1 weighting of the filtered output which is displayed as an image (Claims 7 - 9).

Modulating amplifier gain is one acknowledged solution for GL suppression albeit of lesser merit, see col. 2 lines 3 – 9 of Yamaguchi et al. (Claims 10, 27).

Both narrowing bandwidth and lowering frequency are contemplated, see col. 3 lines 51 – 62. (Claims 11, 27).

A fair categorization of Yamaguchi et al is that it adaptively rejects grating lobe artifact before or after beamformation mapping using object fields based upon angular sectors and implicitly involves analysis of ultrasound data with and without improvement filtering. Additionally Iseki et al makes clear that the grating lobe detection which drives adaptation may be made during the act of scanning by comparison of data from the object's field. (Claims 20, 24).


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Sowelam et al (GE Electronic Systems Library December 1998 - best available copy), Abend et al (US6682483) in Cols. 23 – 25 and Abend (US6524253) use analytical techniques not associated with data –adaptive sparse 2D array sidelobe suppression.

Any inquiry concerning this communication should be directed to Jaworski Francis J. at telephone number 703-308-3061.

FJJ:fjj

02202005



Francis J. Jaworski
Primary Examiner